

Patent claims

1. A dust-collecting filter, comprising:
an air-permeable filter material; and
an adsorbing agent being contained in a loose form in the dust-collecting filter, the adsorbing agent comprising at least one of fibres, flakes and granulate as a supporting material onto which a powdery adsorption material is applied superficially.
2. The dust-collecting filter according to claim 1, wherein the adsorption material is applied in an amount of between 1 and 50 wt-% of the supporting material.
3. The dust-collecting filter according to claim 2, wherein the adsorption material is applied in an amount of between 7 and 25 wt-% of the supporting material.
4. The dust-collecting filter according to claim 1, wherein the adsorption material is selected from at least one of active charcoal, impregnated active charcoal, functionalised carbon, hydrophobic zeolites, hydrophobic, porous polymers, bentonites and crystalline organometallic complexes.
5. The dust-collecting filter according to claim 4, wherein the functionalised carbon is an aromatic carbon skeleton with functional groups.
6. The dust-collecting filter according to claim 4, wherein the active charcoal is one of coconut shell, wood, rock and bamboo charcoal.

7. The dust-collecting filter according to claim 4, wherein the active charcoal is impregnated with at least one of (i) one of acid chemicals and basic chemicals and (ii) silver salts.
8. The dust-collecting filter according to claim 4, wherein the zeolites have micropores of a pore size $> 5 \text{ \AA}$.
9. The dust-collecting filter according to claim 8, wherein the pore size of the micropores is $> 6.5 \text{ \AA}$.
10. The dust-collecting filter according to claim 8, wherein a specific surface of the zeolites is $> 400 \text{ m}^2/\text{g}$.
11. The dust-collecting filter according to claim 8, wherein the zeolites have a modulus > 200 .
12. The dust-collecting filter according to claim 8, wherein the zeolites have a modulus > 300 .
13. The dust-collecting filter according to claim 8, wherein a particle size of the zeolites is in a range between 2 and 30 μm .
14. The dust-collecting filter according to claim 4, wherein the porous polymers have micropores of 6 to 20 \AA , mesopores of 20 to 500 \AA and macropores $> 500 \text{ \AA}$.
15. The dust-collecting filter according to claim 4, wherein an average pore diameter is between 3 and 300 \AA .
16. The dust-collecting filter according to claim 4, wherein a particle size of the porous polymers is in a range between 1 and 500 μm .

17. The dust-collecting filter according to claim 4, wherein a particle size of the porous polymers is in a range between 1 and 200 μm .

18. The dust-collecting filter according to claim 4, wherein the pore volume is equal to 0.4 cm^3/g .

19. The dust-collecting filter according to claim 4, wherein the porous polymers are hydrophobic.

20. The dust-collecting filter according to claim 4, wherein the porous polymers are constructed from at least one of styrene, acrylic acid and their derivatives.

21. The dust-collecting filter according to claim 1, wherein the adsorption material is at least one of chemically bound and physically bound to the supporting material.

22. The dust-collecting filter according to claim 1, wherein the adsorption material is bound to the supporting material which is an electrostatically charged.

23. The dust-collecting filter according to claim 1, wherein the adsorption material is powdery and has a mean particle size between 1 and 100 μm .

24. The dust-collecting filter according to claim 1, wherein the supporting material comprises fibres which are selected from at least one of chemical fibres and natural fibres.

25. The dust-collecting filter according to claim 24, wherein

the fibres are rendered antibacterial.

26. The dust-collecting filter according to claim 24, wherein the chemical fibres are cellulose fibres.

27. The dust-collecting filter according to claim 24, wherein the chemical fibres are at least one of viscose fibres and synthetic fibres.

28. The dust-collecting filter according to claim 26, wherein the synthetic fibres are selected from fibres formed from at least one of polyolefins, polyester, polyamides, polyacrylonitrile and polyvinyl alcohol.

29. The dust-collecting filter according to claim 24, wherein the natural fibres are selected from at least one of cellulose, wood fibre materials, kapok, flax, jute, Manila hemp, coco, wool, cotton, Kenaf, abaca, mulberry bast and fluff pulp.

30. The dust-collecting filter according to claim 24, wherein the fibres are at least one of smooth, branched, crimped, hollow and textured and have a non-circular cross-section.

31. The dust-collecting filter according to claim 24, wherein the fibres are at least one of smooth, branched, crimped, hollow and textured and have a trilobal cross-section.

32. The dust-collecting filter according to claim 24, wherein the fibres have a mean length of between 0.3 mm and 100 mm.

33. The dust-collecting filter according to claim 24, wherein the fibres have a mean length of between 0.5 mm and 70 mm.

34. The dust-collecting filter according to claim 24, wherein the fibres have a mean length of between 1 and 9.5 mm.

35. The dust-collecting filter according to claim 1, wherein the supporting material comprises flakes which are selected from cellular plastics, non-wovens, textiles, foamed starch, foamed polyolefins, as well as films and recovered fibres.

36. The dust-collecting filter according to claim 35, wherein the flakes have a diameter between 0.3 mm and 30 mm.

37. The dust-collecting filter according to claim 35, wherein the flakes have a diameter between 0.5 mm and 20 mm.

38. The dust-collecting filter according to claim 35, wherein the flakes have a diameter between 1 and 9.5 mm.

39. The dust-collecting filter according to claim 1, wherein the supporting material comprises granulates which are selected from macroporous polymers.

40. The dust-collecting filter according to claim 39, wherein a particle size of the granulates is in a range between 0.2 and 1.5 mm.

41. The dust-collecting filter according to claim 39, wherein a particle size of the granulates is in a range between 0.3 and 1.0 mm.

42. The dust-collecting filter according to claim 39, wherein the macroporous polymers are constructed from at least one of

polystyrene, acrylic acid and their derivatives.

43. The dust-collecting filter according to claim 39, wherein a surface of the macroporous polymers is $> 200 \text{ m}^2/\text{g}$.

44. The dust-collecting filter according to claim 39, wherein a surface of the macroporous polymers is $> 350 \text{ m}^2/\text{g}$.

45. The dust-collecting filter according to claim 39, wherein the porosity is less or equal to 0.4 ml/ml .

46. The dust-collecting filter according to claim 1, wherein the adsorbing agent is enclosed in an air-permeable wrapper.

47. The dust-collecting filter according to claim 46, wherein the wrapper is an air-permeable non-woven.

48. The dust-collecting filter according to claim 1, wherein between 0.03 and 5 g of the adsorbing agent per 1000 cm^3 are contained in the dust-collecting filter.

49. The dust-collecting filter according to claim 48, wherein between 0.3 and 2 g of the adsorbing agent are contained per 1000 cm^3 .

50. The dust-collecting filter according to claim 1, wherein the adsorbing agent is present in a bag, which has an air-permeable wrapper, in the dust-collecting filter.

51. The dust-collecting filter according to claim 50, wherein the adsorbing agent is arranged under a covering in part of an inner surface of the dust-collecting filter.

52. The dust-collecting filter according to claim 51, wherein the covering is a non-woven layer.

53. The dust-collecting filter according to claim 51, wherein the adsorbing agent is contained in a pad which is arranged on part of the inner surface of the dust-collecting filter.

54. The dust-collecting filter according to claim 53, wherein the pad comprises at least one layer of one of a filter paper and a special non-woven, the adsorbing agent arranged on the surface of the filter paper being covered by the at least one non-woven layer.

55. The dust-collecting filter according to claim 50, wherein the wrapper material of one of the bag and the covering is formed from a material which is destructable under operating conditions.

56. The dust-collecting filter according to claim 1, wherein the dust-collecting filter has predetermined dimensions and design to operate with a volume flow rate between 10 cm³/h and 400 m³/h.

57. The dust-collecting filter according to claim 1, wherein the filter material of the dust-collecting filter is at least one of (i) one of a single-layer paper and a multilayer paper and (ii) a non-woven material.

58. The dust-collecting filter according to claim 1, wherein the dust-collecting filter is a vacuum-cleaner bag.

59. The dust-collecting filter according to claim 1, wherein dust-collecting filter is one of a pleated filter and a bag filter.
60. A method, comprising:
adsorbing odours with a dust-collecting filter according to claim 1.
61. The method according to claim 60, wherein between 0.2 and 5 g of the adsorbing agent are used per 1000 cm³ of the dust-collecting filter.
62. The method according to claim 60, further comprising:
introducing the adsorbing agent into the dust-collecting filter one of (i) before a start of a first suction process and (ii) at the start of the suction process.
63. The method according to claim 60, wherein the adsorbing agent is present in a wrapper and, the method further comprising:
introducing the adsorbing agent into the dust-collecting filter one of (i) before a start of a first suction process and (ii) at the start of the suction process.
64. The method according to claim 63, wherein the wrapper is destroyable at a predefined volume flow rate.
65. The method according to claim 60, wherein the method is for vacuum-cleaning using one of a cylinder vacuum-cleaner and an upright vacuum-cleaner.